(12) UK Patent Application (19) GB (11) 2 356 522 (13) A

(43) Date of A Publication 23.05.2001

(21) Application No 9926182.8

(22) Date of Filing 04.11.1999

(71) Applicant(s)
Mitel Corporation
(Incorporated in Canada - Ontario)
PO Box 13089, 350 Legget Drive, Kanata, Ontario, K2K 1X3, Canada

(72) Inventor(s)
Janusz Janulewicz

(74) Agent and/or Address for Service
Kilburn & Strode
20 Red Lion Street, LONDON, WC1R 4PJ, United Kingdom

(51) INT CL[7]
H04M 1/00

(52) UK CL (Edition S)
H4K KFH
H4T TBLA T113

(56) Documents Cited
GB 2295747 A WO 97/08879 A US 5644628 A

(58) Field of Search
UK CL (Edition R) H4K KFH , H4T TBLA TBLX
INT CL[7] H04M 1/00
ONLINE : WPI ; EPODOC ; JAPIO

(54) Abstract Title
Graphical user interface in a telephony application

(57) A graphical user interface wherein a first icon is provided showing an initial status of a telephone line, an activation event is sensed and the first icon is changed to a second icon to show an updated status of the telephone line which is implemented in a computer-based telephony system. The system can be controlled via the clicking, either left clicking or right clicking, a computer mouse.

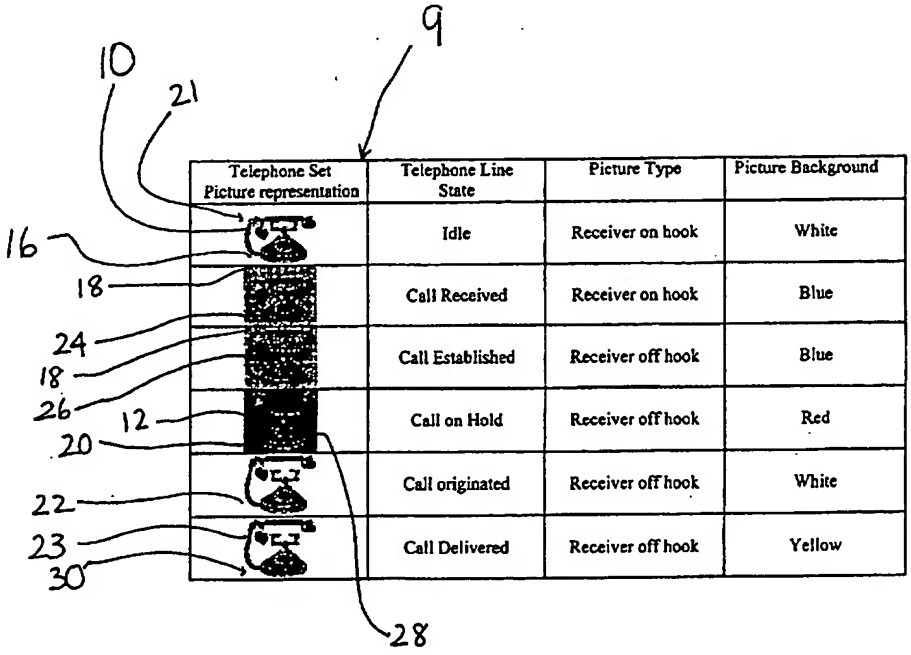


Fig. 2

GB 2 356 522 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print incorporates corrections made under Section 117(1) of the Patents Act 1977.

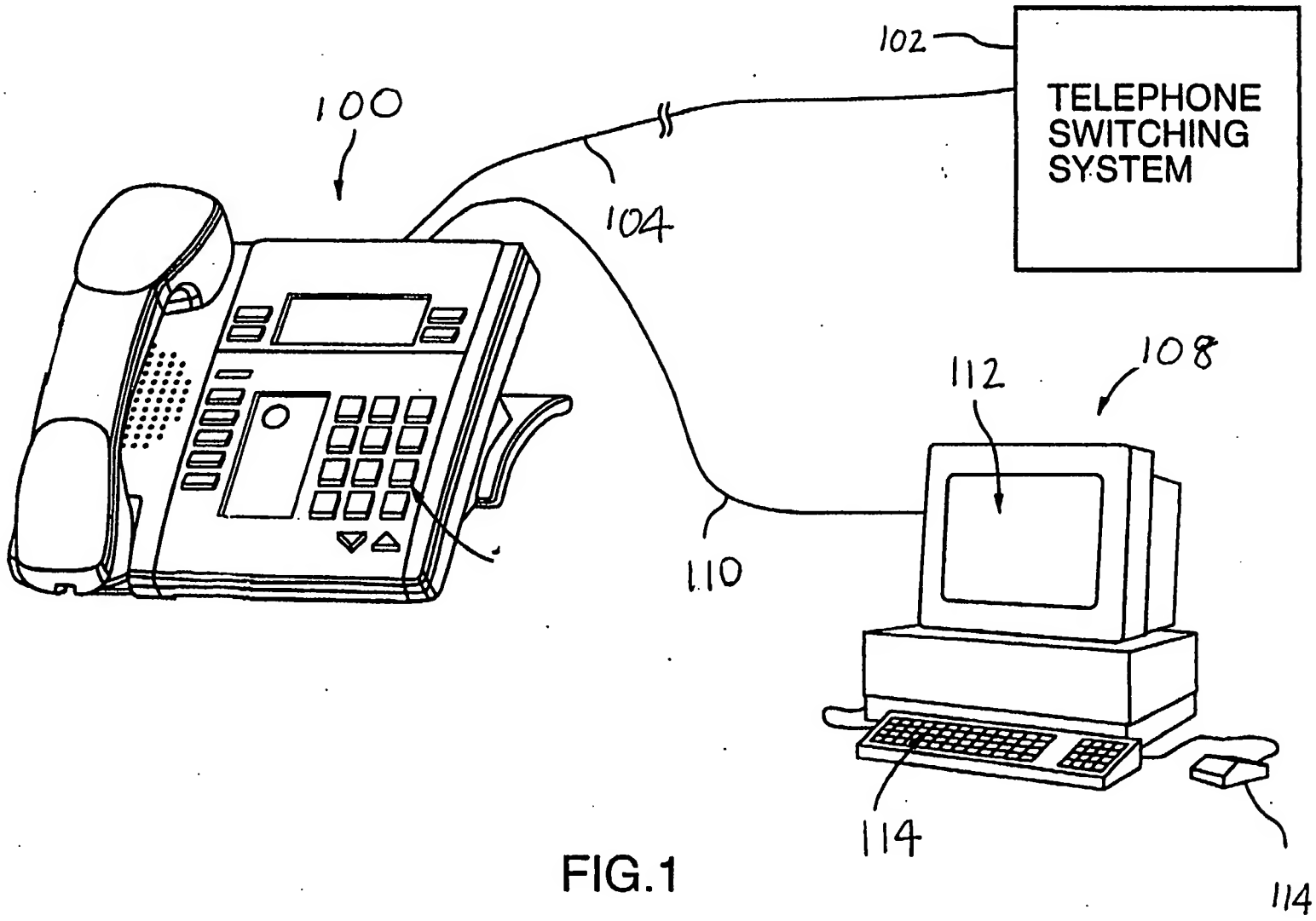
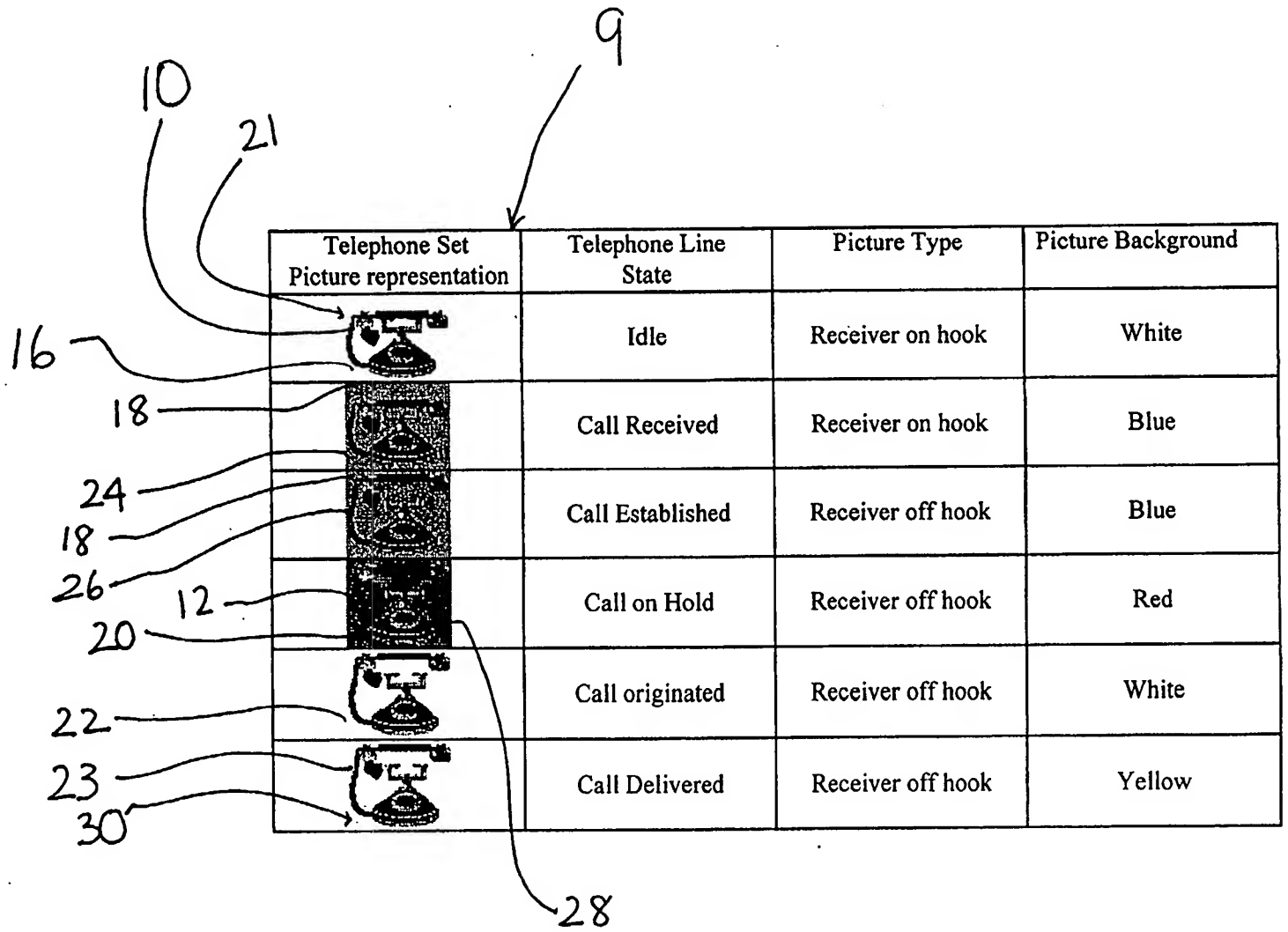


FIG.1



Telephone Set Picture representation	Telephone Line State	Picture Type	Picture Background
	Idle	Receiver on hook	White
	Call Received	Receiver on hook	Blue
	Call Established	Receiver off hook	Blue
	Call on Hold	Receiver off hook	Red
	Call originated	Receiver off hook	White
	Call Delivered	Receiver off hook	Yellow

Fig. 2

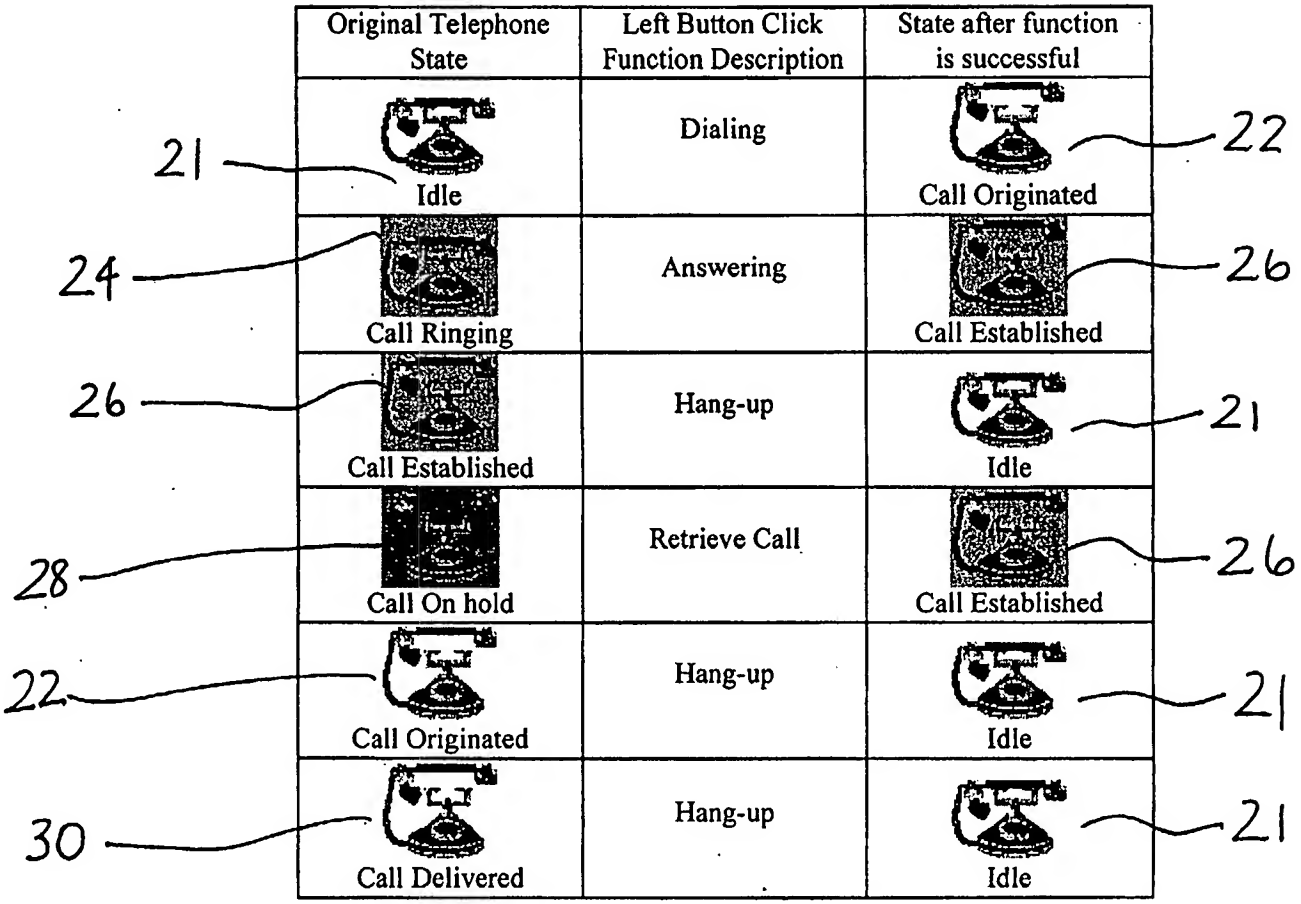

Original Telephone State
Left Button Click Function Description
State after function is successful
Idle
Dialing
Call Originated
Call Ringing
Answering
Call Established
Call Established
Hang-up
Idle
Call On hold
Retrieve Call
Call Established
Call Originated
Hang-up
Idle
Call Delivered
Hang-up
Idle
21
22
24
26
26
21
28
26
22
21
30
21

Fig. 3

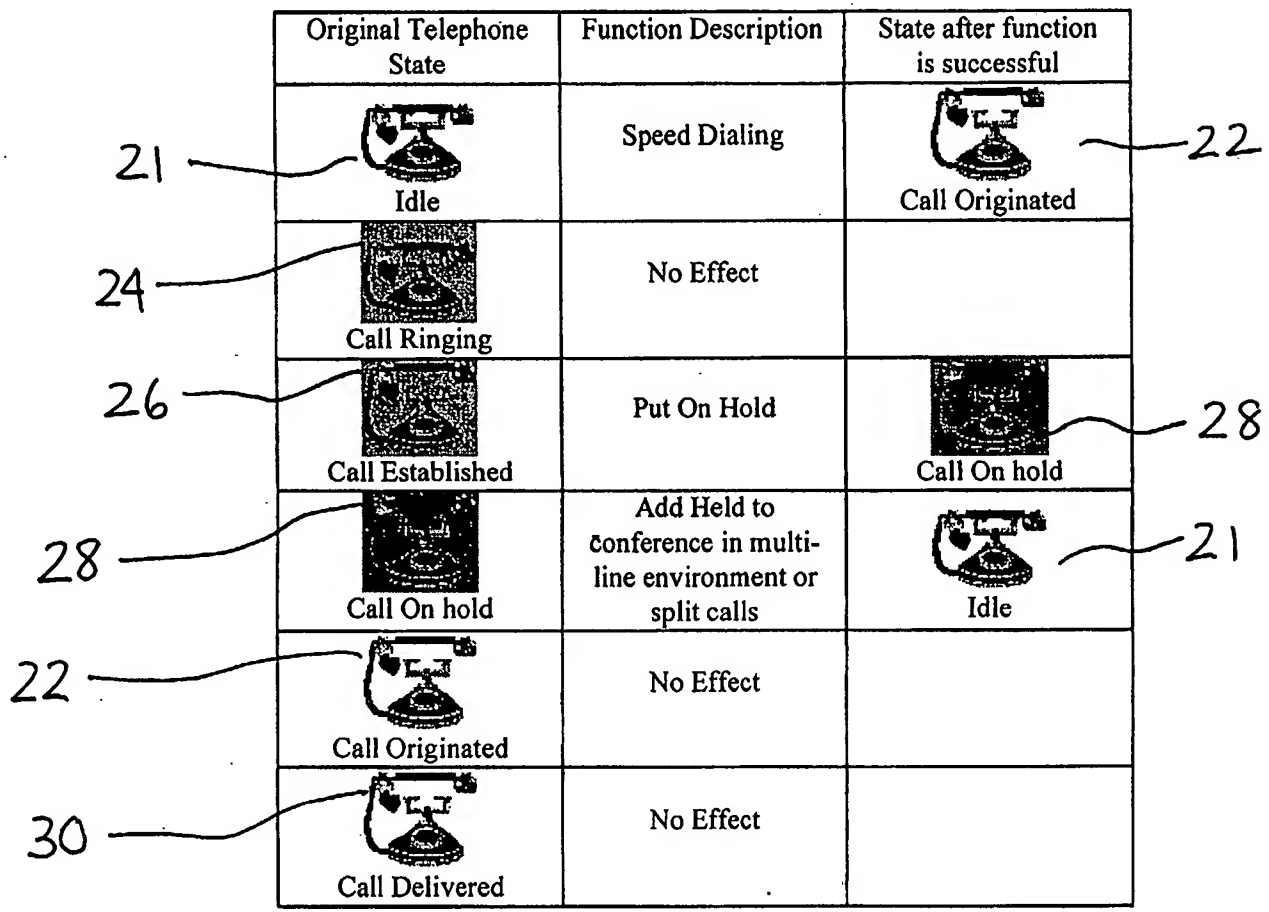

Original Telephone State
Function Description
State after function is successful
21
Idle
Speed Dialing
22
Call Originated
24
Call Ringing
No Effect
26
Call Established
Put On Hold
28
Call On hold
28
Call On hold
Add Held to conference in multi-line environment or split calls
21
Idle
22
Call Originated
No Effect
30
Call Delivered
No Effect

Fig. 4.

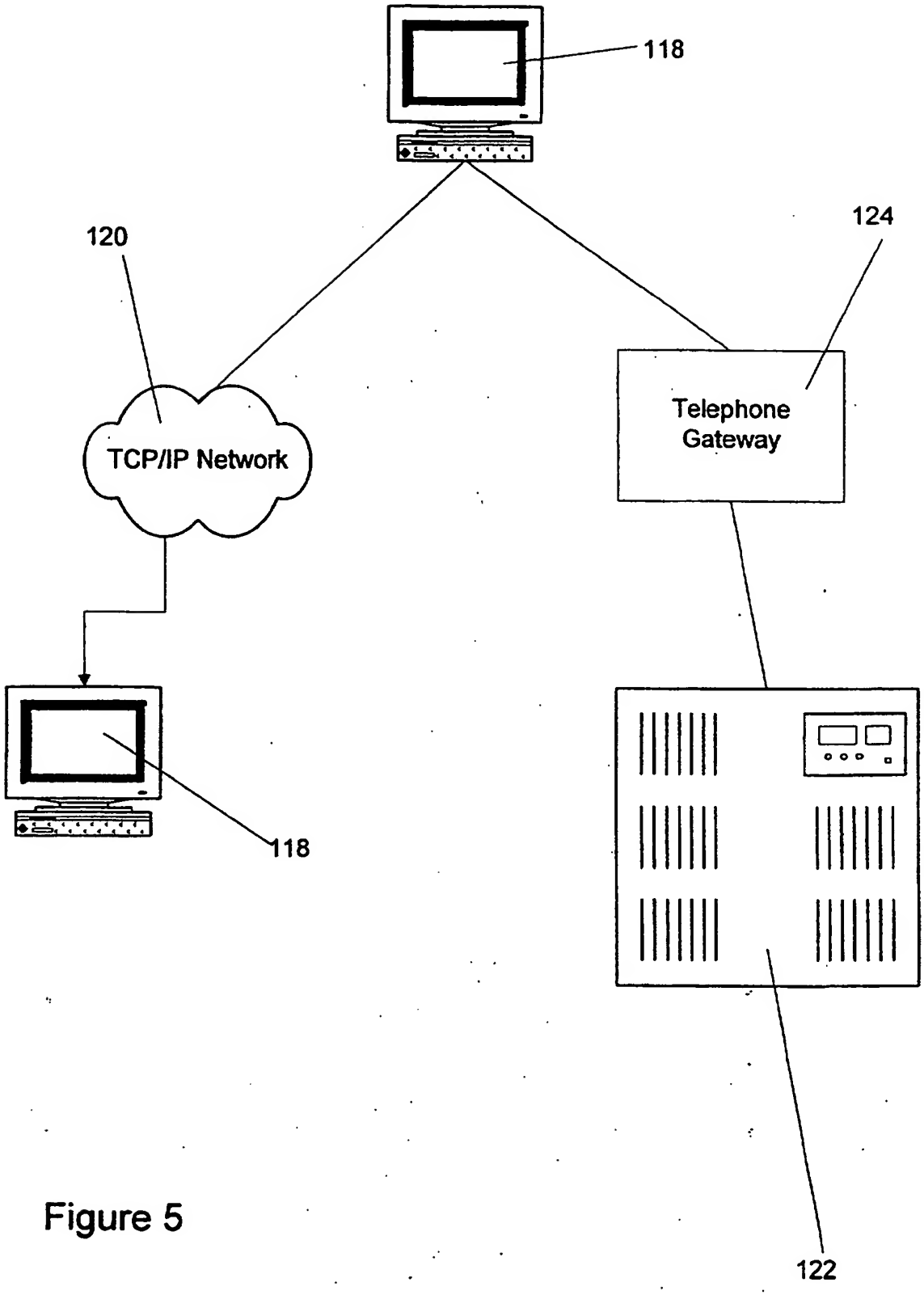


Figure 5

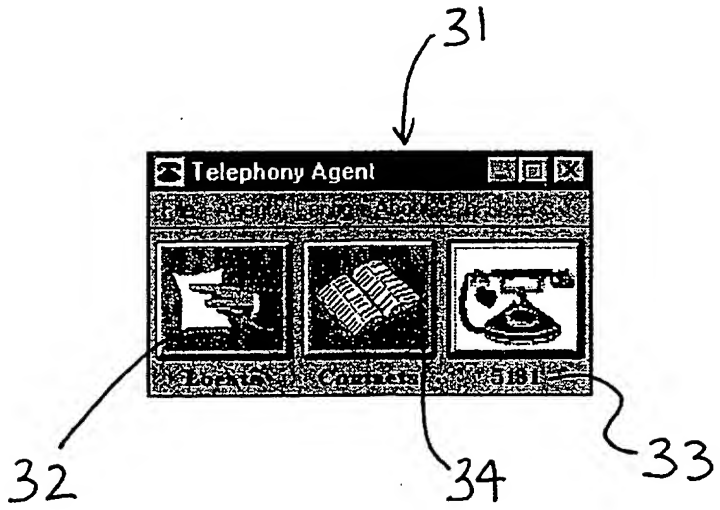

31
Telephony Agent
32
34
33

Fig. 6

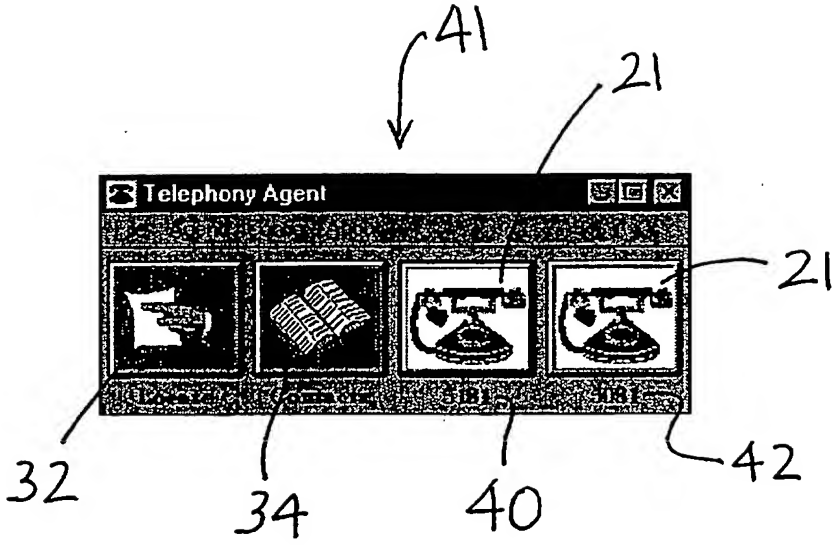

41
21
Telephony Agent
21
32
34
40
42

Fig. 6a

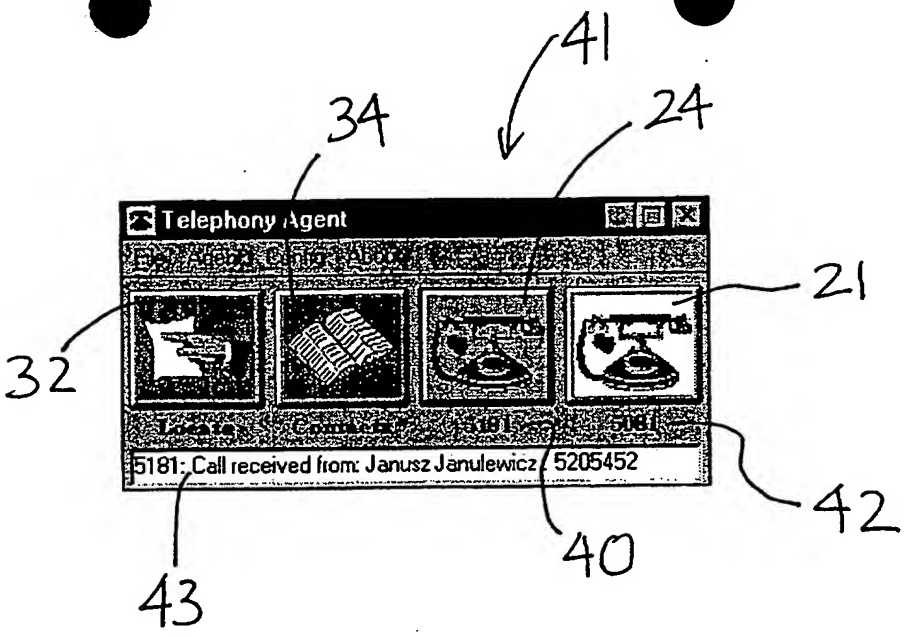

41
34
24
Telephony Agent
21
32
5181: Call received from: Janusz Janulewicz : 5205452
42
40
43

Fig. 7

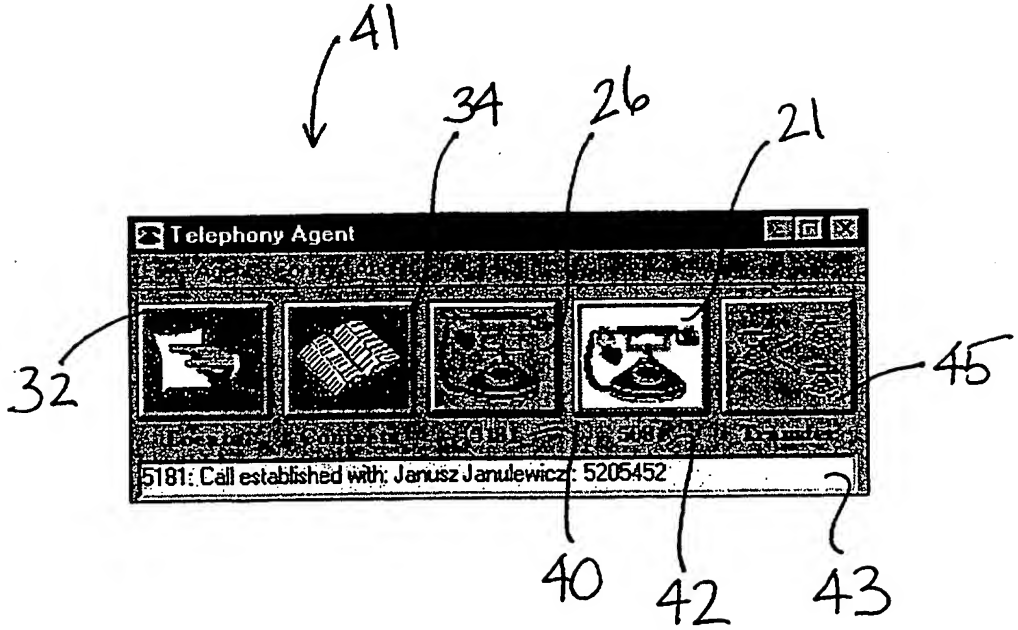

41
34
26
21
Telephony Agent
32
45
5181: Call established with: Janusz Janulewicz : 5205452
40
42
43

Fig. 8

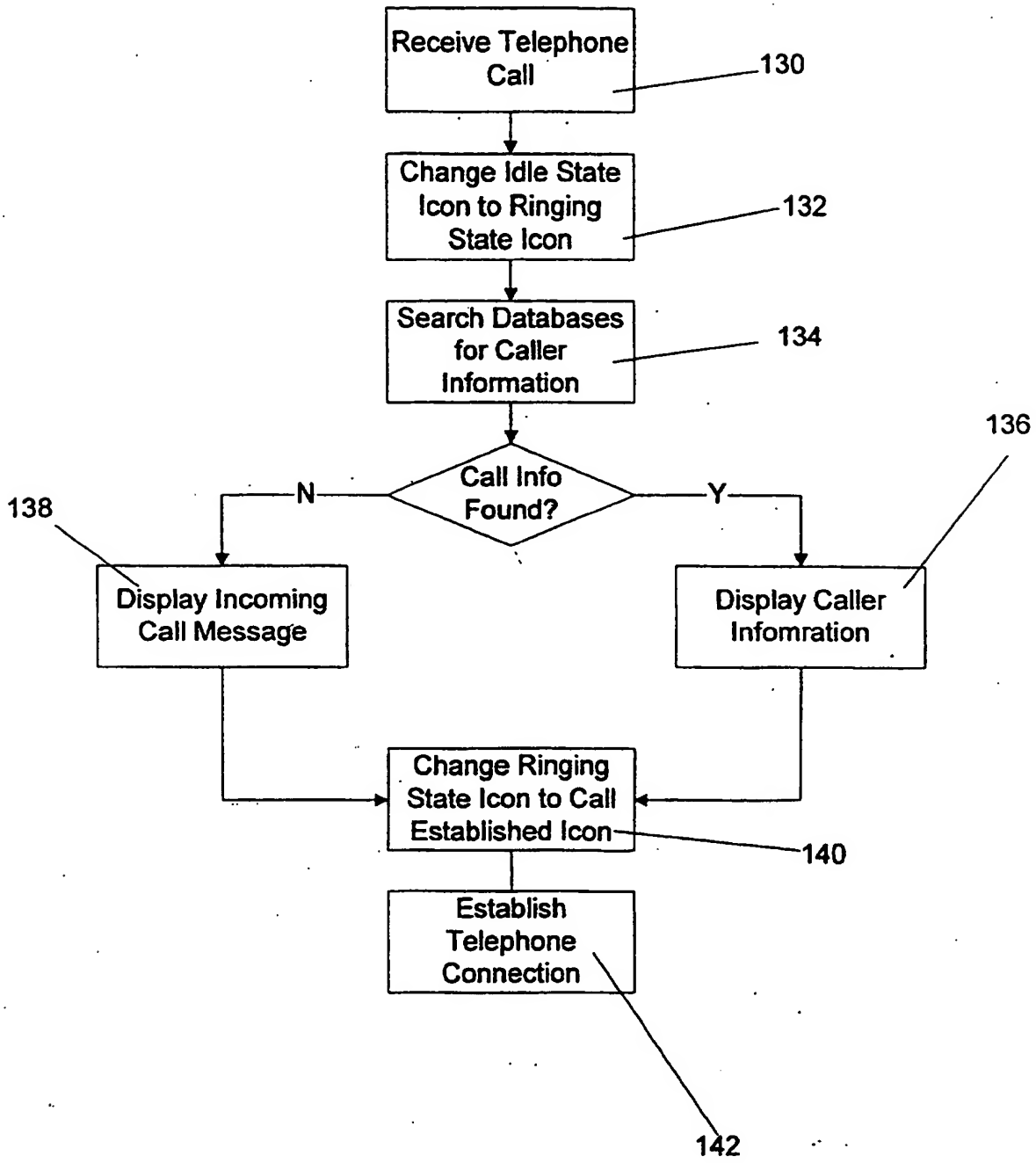

Receive Telephone Call
130
Change Idle State Icon to Ringing State Icon
132
Search Databases for Caller Information
134
136
Call Info Found?
N
Y
138
Display Incoming Call Message
Display Caller Infomration
Change Ringing State Icon to Call Established Icon
140
Establish Telephone Connection
142

Figure 7a

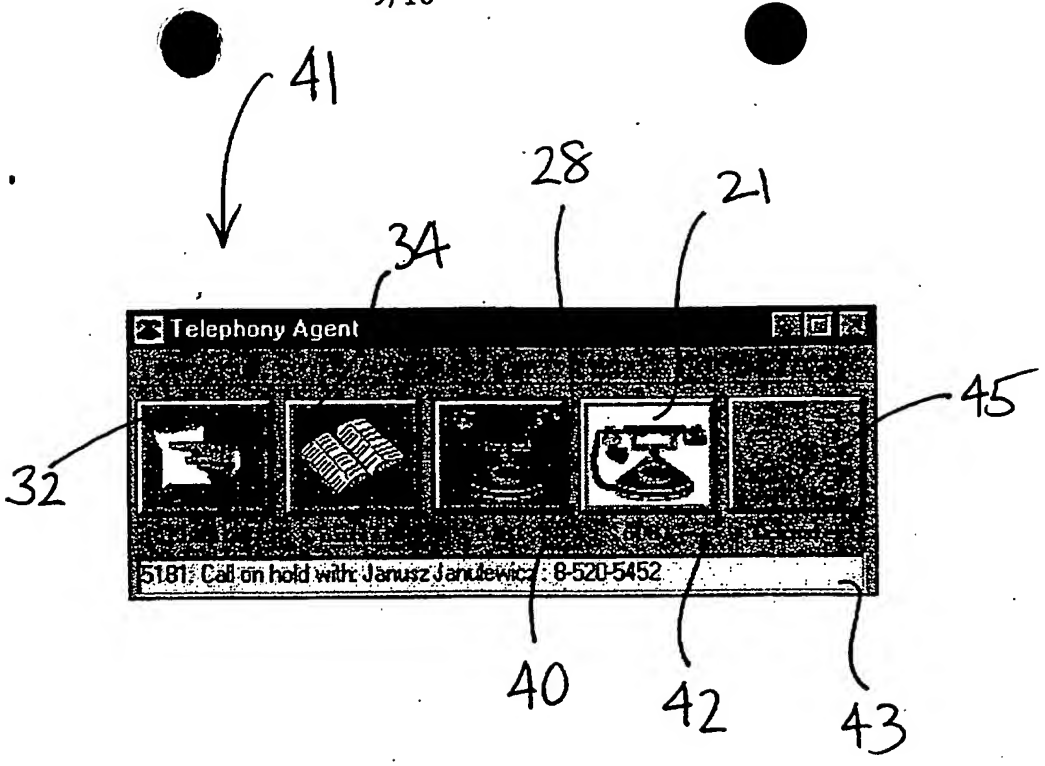

41
28
21
34
Telephony Agent
45
32
5181: Call on hold with: Janusz Janulewicz : 8-520-5452
40
42
43

Fig. 9

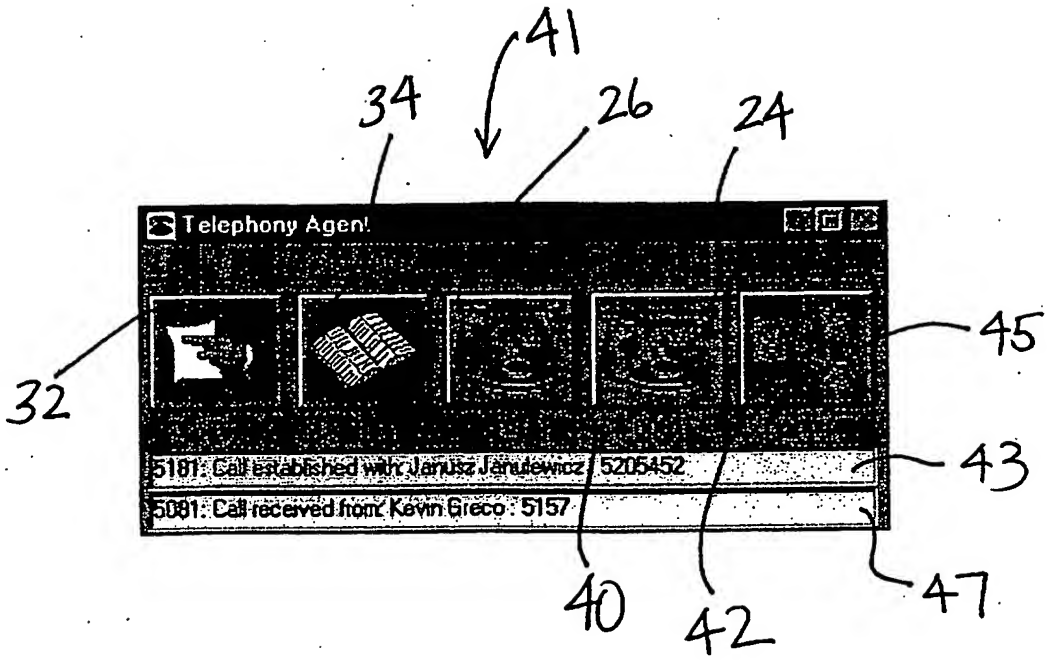
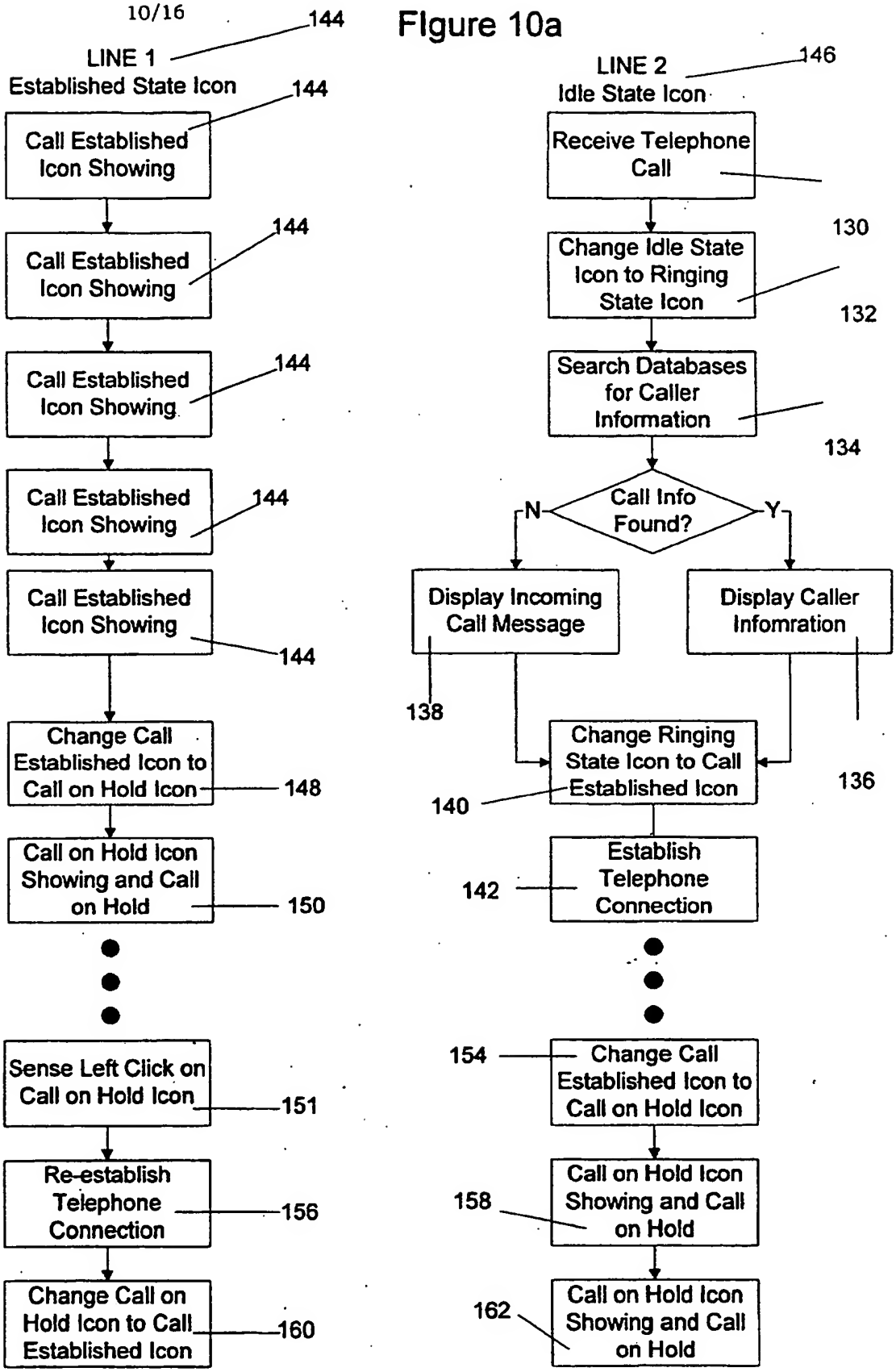

41
34
26
24
Telephony Agent
45
32
43
5181: Call established with: Janusz Janulewicz : 5205452
5081: Call received from: Kevin Greco : 5157
40
42
47

Fig. 10

Figure 10a


LINE 1
Established State Icon
144
Call Established Icon Showing
144
Call Established Icon Showing
144
Call Established Icon Showing
144
Call Established Icon Showing
144
Call Established Icon Showing
144
Change Call Established Icon to Call on Hold Icon
148
Call on Hold Icon Showing and Call on Hold
150
Sense Left Click on Call on Hold Icon
151
Re-establish Telephone Connection
156
Change Call on Hold Icon to Call Established Icon
160
LINE 2
Idle State Icon
146
Receive Telephone Call
130
Change Idle State Icon to Ringing State Icon
132
Search Databases for Caller Information
134
Call Info Found?
N
Y
Display Incoming Call Message
Display Caller Infomration
138
Change Ringing State Icon to Call Established Icon
136
140
Establish Telephone Connection
142
154
Change Call Established Icon to Call on Hold Icon
158
Call on Hold Icon Showing and Call on Hold
162
Call on Hold Icon Showing and Call on Hold

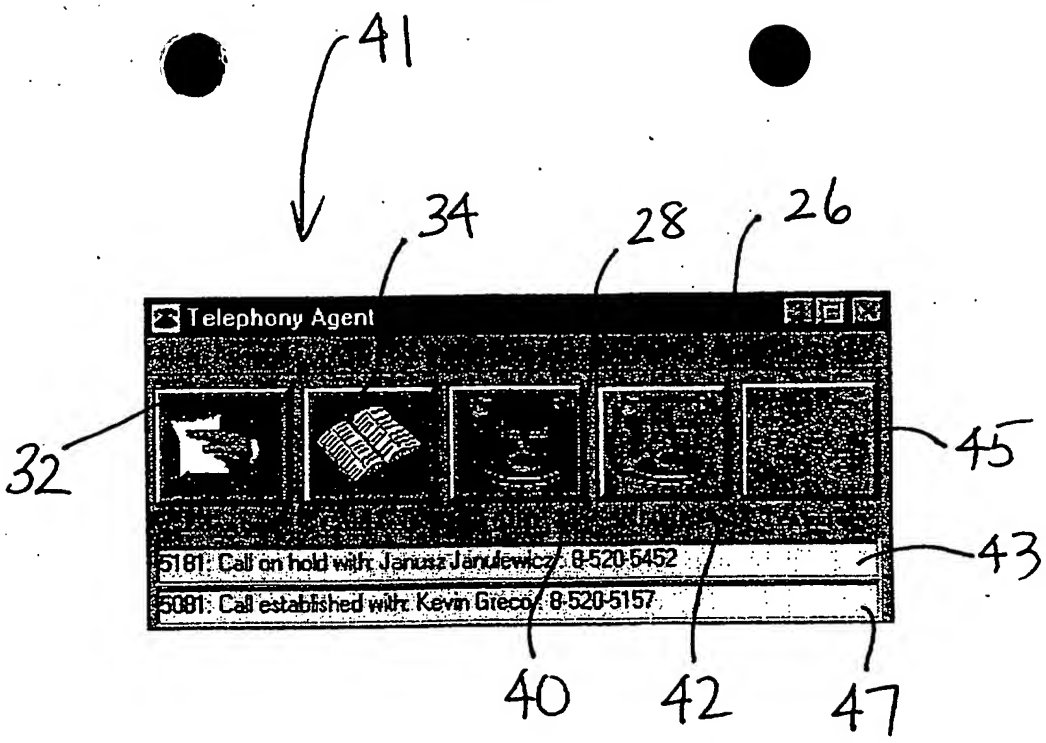

41
34
28
26
Telephony Agent
32
45
5181: Call on hold with: Janusz Janulewicz : 8-520-5452
43
5081: Call established with: Kevin Greco : 8-520-5157
40
42
47

Fig. 11

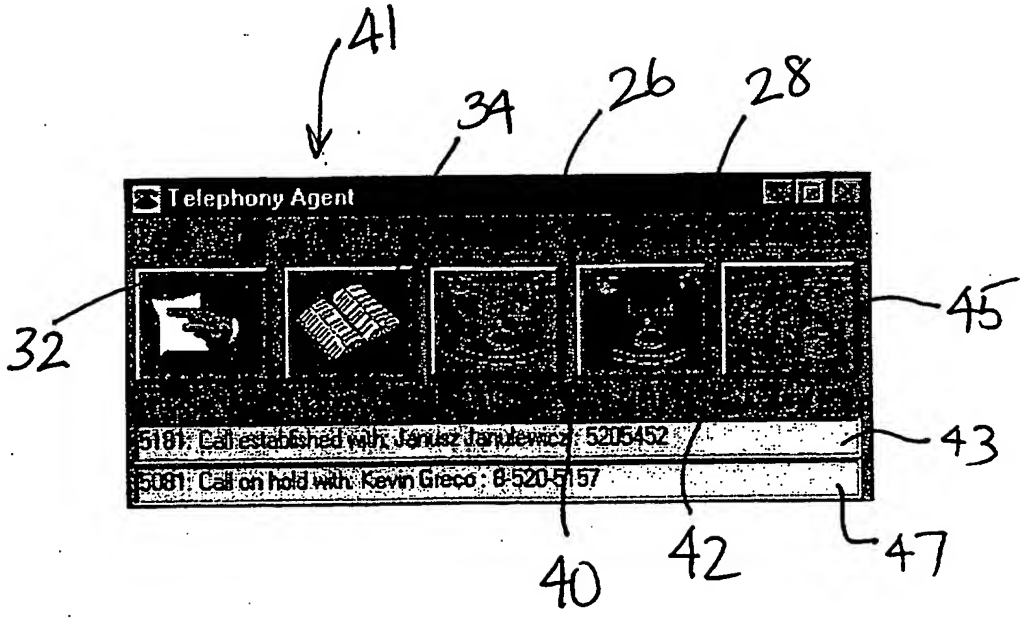

41
34
26
28
Telephony Agent
32
45
5181: Call established with: Janusz Janulewicz : 5205452
43
5081: Call on hold with: Kevin Greco : 8-520-5157
40
42
47

Fig. 12

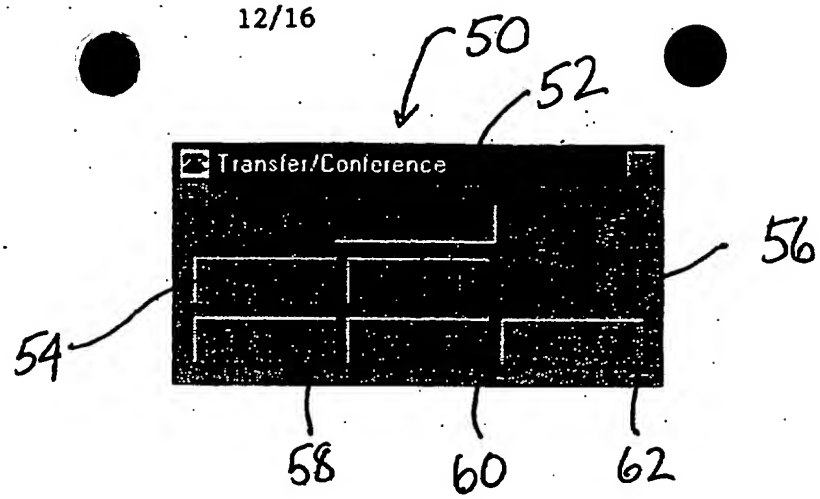


Fig. 13

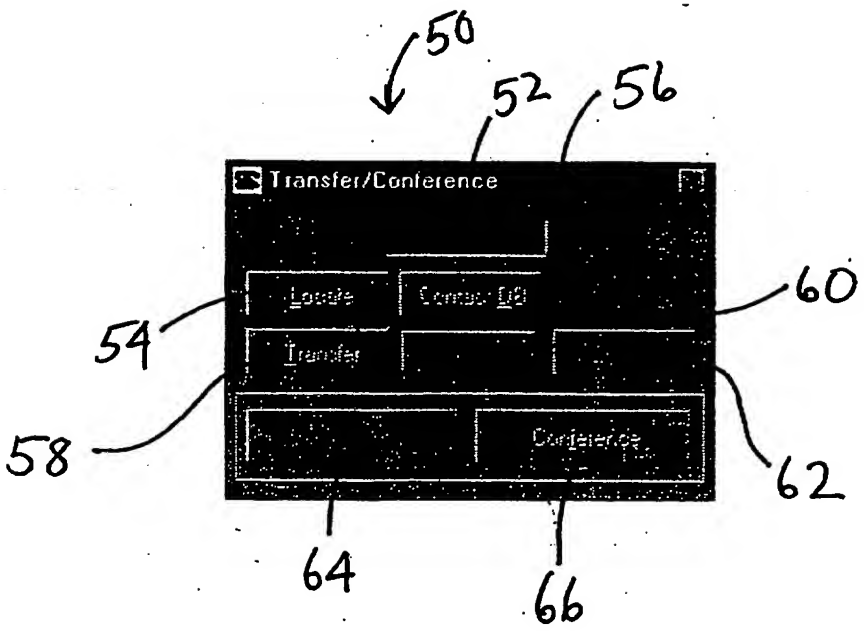


Fig. 14

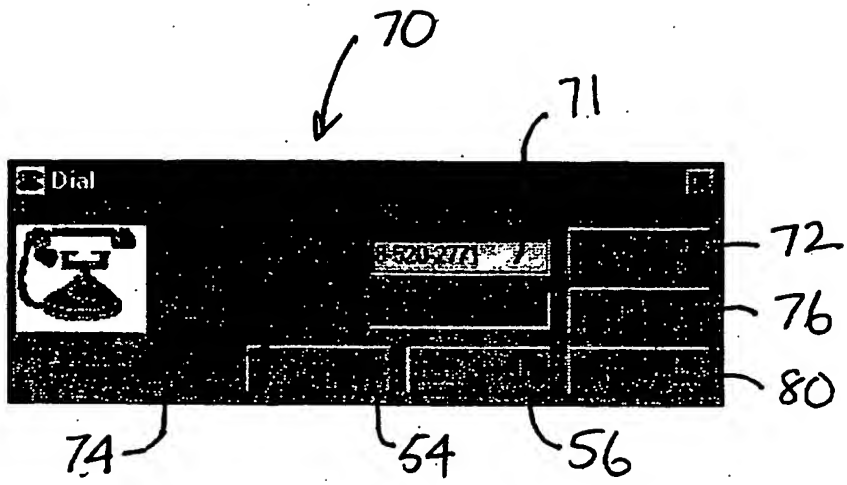


Fig. 15

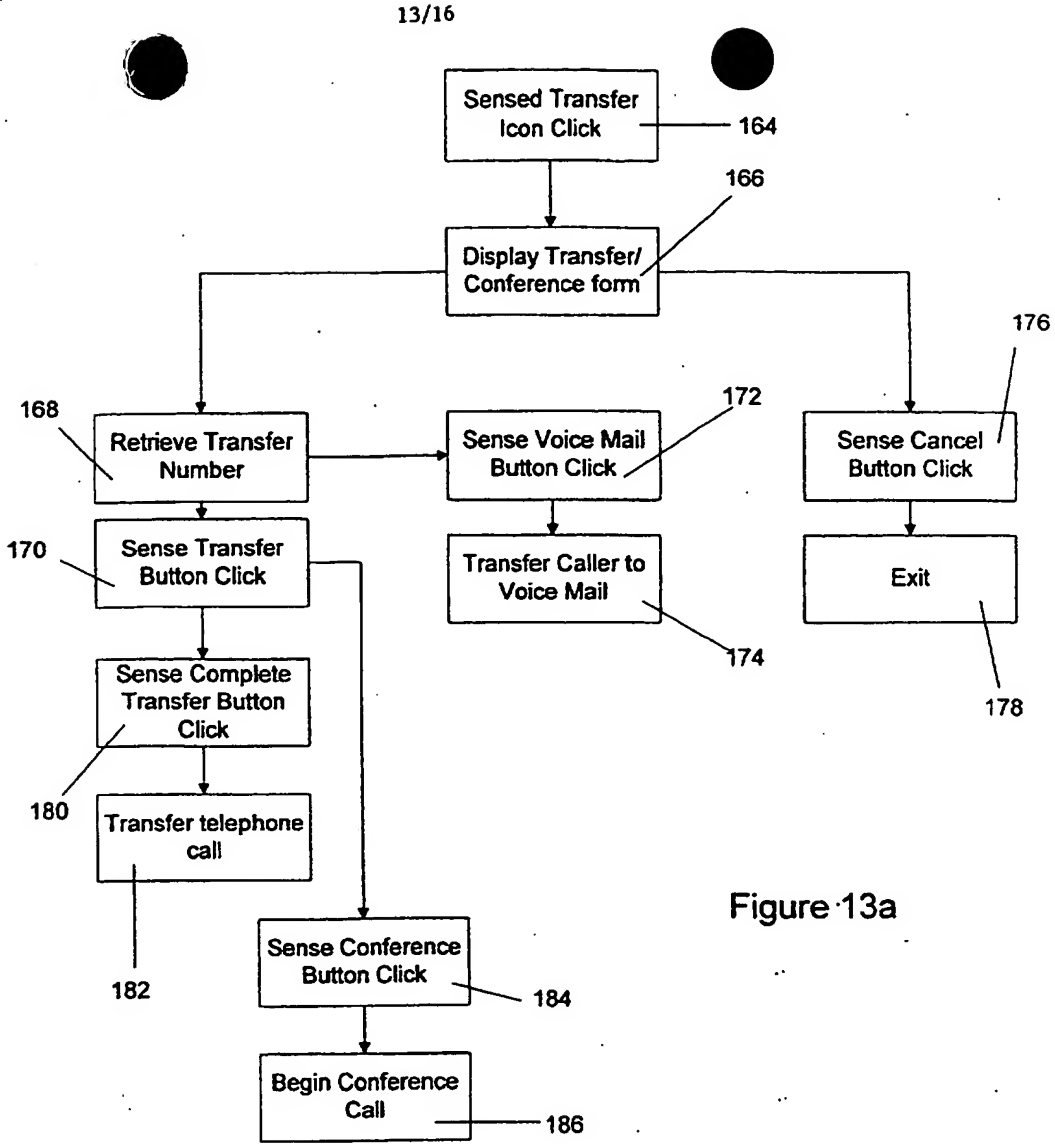

Sensed Transfer Icon Click
164
166
Display Transfer/ Conference form
176
168
Retrieve Transfer Number
172
Sense Voice Mail Button Click
Sense Cancel Button Click
170
Sense Transfer Button Click
Transfer Caller to Voice Mail
Exit
174
178
Sense Complete Transfer Button Click
180
Transfer telephone call
182
Sense Conference Button Click
184
Begin Conference Call
186

Figure 13a

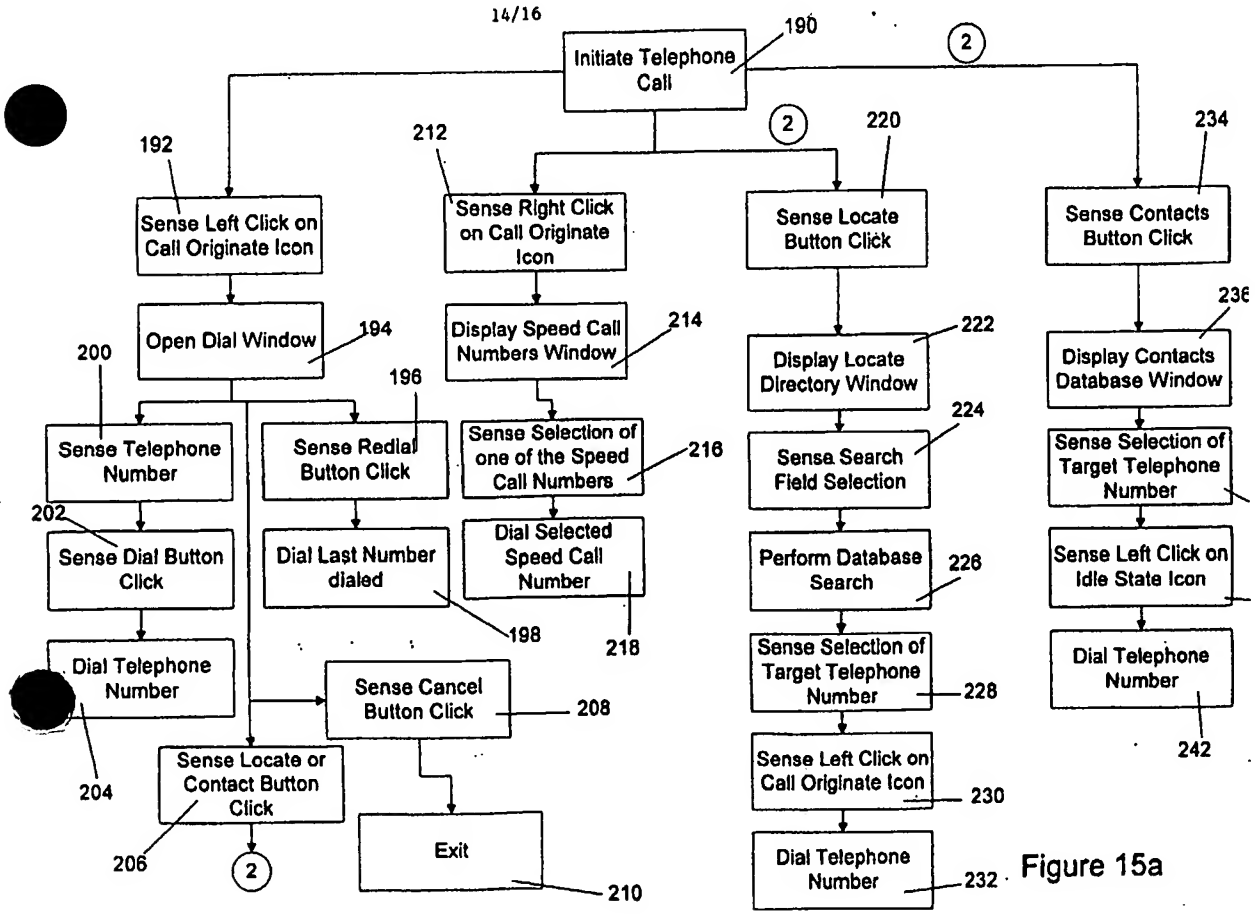

Initiate Telephone Call
190
2
192
Sense Left Click on Call Originate Icon
Open Dial Window
194
200
Sense Telephone Number
202
Sense Dial Button Click
Dial Telephone Number
204
206
2
196
Sense Redial Button Click
Dial Last Number dialed
198
Sense Cancel Button Click
208
Exit
210
212
Sense Right Click on Call Originate Icon
Display Speed Call Numbers Window
214
Sense Selection of one of the Speed Call Numbers
216
Dial Selected Speed Call Number
218
220
Sense Locate Button Click
Display Locate Directory Window
222
Sense Search Field Selection
224
Perform Database Search
226
Sense Selection of Target Telephone Number
228
Sense Left Click on Call Originate Icon
230
Dial Telephone Number
232
234
Sense Contacts Button Click
Display Contacts Database Window
Sense Selection of Target Telephone Number
Sense Left Click on Idle State Icon
Dial Telephone Number
242

Figure 15a

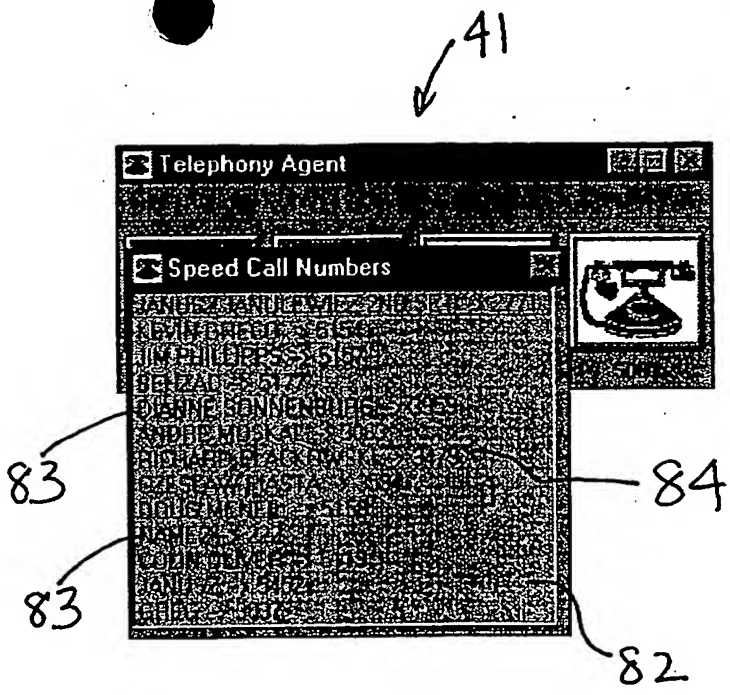

41
Telephony Agent
Speed Call Numbers
83
84
83
82

Fig. 16

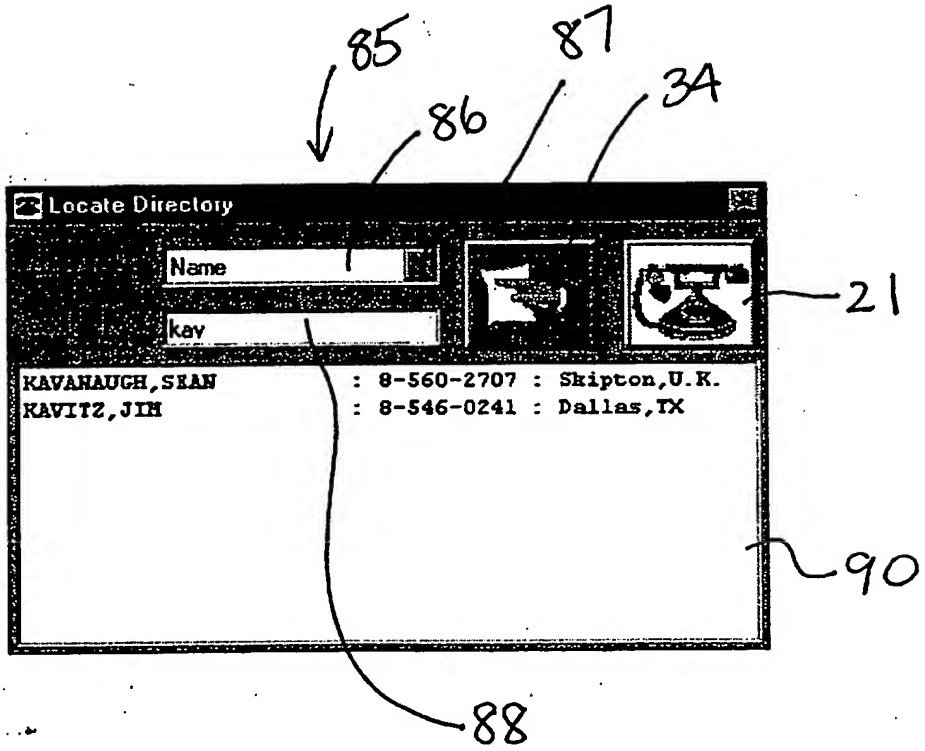

85
87
86
34
Locate Directory
Name
kav
KAVANAUGH,SEAN : 8-560-2707 : Skipton,U.K.
KAVITZ,JIM : 8-546-0241 : Dallas,TX
21
90
88

Fig. 17

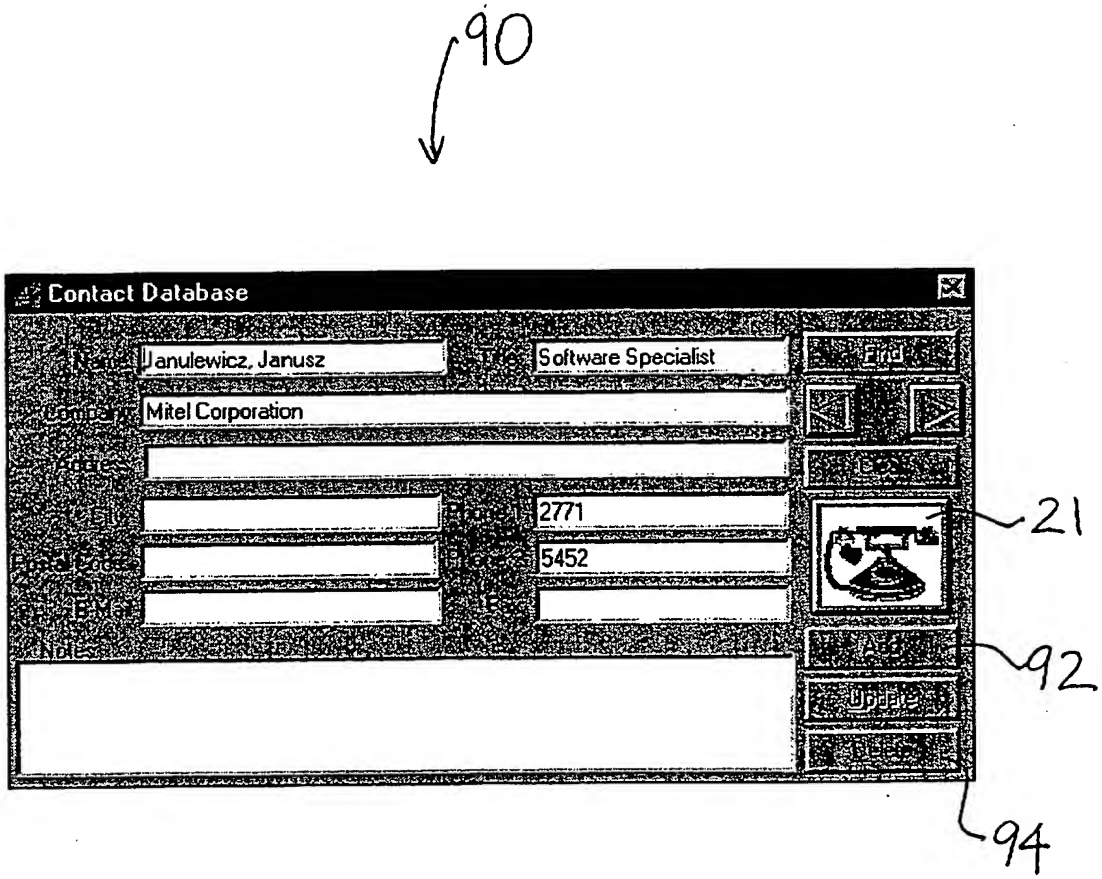

90
Contact Database
Janulewicz, Janusz
Software Specialist
Mitel Corporation
2771
5452
21
92
94

FIG. 18

COMPUTER TELEPHONY APPLICATIONS

Field of the Invention

The present invention relates in general to a graphical user interface and more specifically to a graphical user interface which simplifies telephony applications by providing status of telephone lines.

Background of the Invention

The graphical user interface (GUI) is one of the many components of a computer application. The graphical user interface is what a user of the computer application sees when the application is being run. It will be understood by those skilled in the art that the graphical user interface is one of the most important components of the computer application.

A graphical user interface generally simplifies the actions necessary for a user to perform different functions within the computer application via the use of graphical icons. Prior art graphical user interfaces rely on being aesthetic and simple to use in order to suit any level of computer user. It will be understood by those skilled in the art of user interface creation that constant changes are necessary in order to further simplify user interfaces, not solely in the telephony field but with respect to computer applications in general.

It is an aspect of an object of the present invention to provide a graphical user interface which simplifies telephony applications by providing status of telephone lines and a set of user friendly icons.

Summary of the Invention

It is an aspect of the present invention to provide a method of simplifying telephony actions in a telephony application graphical user interface comprising the steps of:

a) providing a first icon showing an initial status of a telephone line;

b) sensing an activation event;

c) changing said first icon to a second icon to show an updated status of said telephone line.

It is a second aspect of the present invention to provide a telephony application graphical user interface which simplifies telephony actions comprising:

a first icon showing an initial status of a telephone line;

a second icon showing an updated status of a telephone line;

means to change said first icon to said second icon when an activation event is sensed.

Brief Description of the Drawings

An embodiment of the present invention is described below with references to the accompanying drawings, in which

Figure 1 is a schematic illustration of a computer- based telephony system.

Figure 2 is a table showing a graphical representation of a set of icons indicating status of a telephone line;

Figure 3 is a table showing transformation of each icon shown in the table of Figure 2 following selection thereof by a left mouse click;

Figure 4 is a table showing transformation of each icon shown in the table of Figure 2 following selection thereof by a right mouse click;

Figure 5 is a schematic diagram outlining a telephony system of the present invention;

Figure 6 is a screen print of a single telephone line telephony agent window;

Figure 6a is a screen print of a two telephone line telephony agent window;

Figure 7 is a screen print of the telephony agent window of Figure 6 when a telephone call is received on one of the telephone lines;

Figure 7a is a flowchart detailing the actions of a telephony agent application when a telephone call is received on one of the telephone lines;

Figure 8 is a screen print of the telephony agent window of Figure 6 after the telephone call has been answered;

Figure 9 is a screen print of telephony agent window of Figure 6 when a telephone call is placed on hold;

Figure 10 is a screen print of the telephony agent window of Figure 6 when a telephone call is received on the second telephone line;

Figure 10a is a flowchart detailing the actions of the telephony agent application when a telephone call is received on the second telephone line;

Figure 11 is a screen print of the telephony agent window of Figure 6 after the telephone call on the second telephone line is answered;

Figure 12 is a screen print of the telephony agent window of Figure 6 when the call on the first telephone line is re-established;

Figure 13 is a screen print of a telephony agent Transfer/Conference window;

Figure 13a is a flowchart detailing the actions of the telephony agent] application when a telephone call is transferred or placed in a conference call;

Figure 14 is a screen print of the telephony agent Transfer/Conference window of Figure 13 after a call has been transferred; and

Figures 15 to 18 are screen prints showing graphical user interfaces displayed to a user for dialing via regular dialing, speed call dialing, dial number location, and called party call back, respectively and a flowchart detailing the actions of the telephony agent application during these dialing scenarios.

Detailed Description of the Preferred Embodiment

The present invention is implemented in a computer-based telephony system as shown in Figure 1. The telephony system comprises a telephone set **100** connected to a telephone switching system **102** (e.g. central office) via a telephone line **104**. The telephone set **100** is also connected to a personal computer **108** via a serial link **110**. The personal computer **108** includes a monitor or display **112** as well as a mouse pointer **114** and keyboard **116**, in a well known manner. The computer **108** executes a software application for communicating with the telephone set **100** to implement various telephony functions, as discussed in greater detail below.

In the present invention, the software application is stored and executed within the personal computer **108** to provide a graphical user interface which simplifies telephony applications by providing the status or state of connected telephone lines. The graphical user interface helps to simplify the actions necessary to perform functions relating to the telephone set **100**. The graphical user interface involves the use of a set of icons which help a user understand functions being performed by the computer application and clearly

display the status or state of the telephone line. The communication between the telephone set **100** and the software application is realized via a serial, USB or LAN connection.

Turning to Figure 2, a table is provided showing a set of icons **9** indicating status of a telephone line. Since the graphical user interface of the preferred embodiment of the present invention is related to telephony applications, the set of icons **9** utilizes only two telephone pictures: **10** (receiver on hook) and **12** (receiver off hook). The use of different coloured backgrounds (as shown by the shading) for the pictures **10** and **12** reduces the need for more pictures to distinguish between icons.

The set of icons **9** are used to show the status of a telephone line in relation to a telephony application. In the preferred embodiment of the present invention, use of a white background **16** with the receiver on hook picture **10** produces an idle state icon **21** and with the receiver off hook picture **12** produces a call originated state icon **22**. Use of a blue background **18** with the receiver on hook picture **10** produces a call ringing state icon **24** and with the receiver off hook picture **12** produces a call established state icon **26**. Use of a red background **20** with the receiver off hook picture **12** produces a call on hold state icon **28** and use of a yellow background **23** with the receiver off hook picture **12** produces a call delivered state icon **30**. The call delivered state icon **30** is utilized when a call is being initiated or when the telephone set **100** is in a ringing state.

Turning to Figure 3, a table is provided showing an updated status of the telephone line after each icon has been selected by a left mouse click. It will be understood that keyboard strokes may be used in place of the left mouse click button without affecting the operation of the present invention as well as other mouse button clicks. These actions are generally referred to as activation events.

When the telephone line is in an idle state (i.e. when the idle state icon **21** is shown) and the icon **21** is clicked upon by the left mouse button, the idle state icon **21** is changed to the call originated state icon **22**. Meanwhile, a dialing function is called and run. When the telephone line is in a call ringing state (as shown by icon **24**) and the icon **21** is clicked upon by the left mouse button, the call ringing state icon **24** is changed to the call established state icon **26**. Meanwhile, an answering function is called and run. When the telephone line is in a call established state (i.e. when the call established state icon **26** is

shown) and the icon **26** is clicked upon by the left mouse button, the call established state icon **26** is changed to the idle state icon **21**. Meanwhile a hang-up function is called and run. When the telephone line is in a call on hold state (i.e. when the call on hold state icon **28** is shown) and the icon **28** is clicked upon by the left mouse button, the call on hold state icon **28** is changed to the call established state icon **26**. Meanwhile, a retrieve call function is called and run. When the telephone line is in a call originated state (i.e. when the call originated state icon **22** is shown) and the icon **22** is clicked upon by the left mouse button, the call originated state icon **22** is changed to the idle state icon **21**. Meanwhile, the hang-up function is called and run. Finally, when the telephone line is in a call delivered state, (i.e. when the call delivered state icon **30** is shown) and the icon **30** is clicked upon by the left mouse button, the call delivered state icon **30** is changed to the idle state icon **22**. Meanwhile, the hang-up function is called and run.

Turning to Figure 4, a table is provided showing an updated status of the telephone line after each icon has been selected by a right mouse click. It will be understood that keyboard strokes may be used in place of the right mouse click button without affecting the operation of the present invention. These actions are generally referred to as activation events.

When the telephone line is in an idle state (i.e. when the idle state icon **21** is shown) and the icon **21** is clicked upon by the right mouse button, the idle state icon **21** is changed to the call originated state icon **22**. Meanwhile, a speed dialing function is called and run. When the telephone line is in a call ringing state (as shown by icon **24**) and the icon **21** is clicked upon by the right mouse button, the call ringing state icon **24** is not effected. When the telephone line is in a call established state (i.e. when the call established state icon **26** is shown) and the icon **26** is clicked upon by the right mouse button, the call established state icon **26** is changed to the call on hold state icon **28**. Meanwhile, put on hold function is called and run. When the telephone line is in a call on hold state (i.e. when the call on hold state icon **28** is shown) and the icon **28** is clicked upon by the right mouse button, the call on hold state icon **28** is changed to the idle state icon **21**. Meanwhile, an add held call to conference in multi-line environment or split calls function is called and run. When the telephone line is in a call originated state (i.e. when the call originated state icon **22** is shown) and the icon **22** is clicked upon by the right mouse button, the call originated state icon **22** is

not effected. Finally, when the telephone line is in a call delivered state, (i.e. when the call delivered state icon **30** is shown) and the icon **30** is clicked upon by the right mouse button, the call delivered state icon **30** is not effected.

An example of code which recognizes mouse button events is shown below (with respect to a right mouse button click):

```
Private Sub cmdTel_MouseDown (Index As Integer, Button As Integer, Shift As Integer, X
        As Single, Y As Single)
Dim Recount As Integer
Dim I As Integer
If Button = vbRightButton and gState(Index) = "EstablishedState" Then
        HoldCall (Index)
        Exit Sub
End If
If SpeedCallsRS.RecordCount > 0 Then
        SpeedCallsRS.MoveLast
        SpeedCallsRs.MoveFirst
End IF
If Button = vbRightButton And gState ((Index + 1) Mod 2) = "IdleState" Then
        If gState((Index + 1) Mod 2) = "IdleState" Then
                lblStatus(0) = ""
                lblStatus(1) = ""
                SetHeight
        End IF
gDIndex = Index
FrmSpeedNum.Show 1
End If
End Sub
```

It will be understood that code similar to the above sample code is used to recognize mouse button events with respect to a left mouse button click. As discussed above, when the call established icon **26** is clicked upon by the right mouse button, the call established state icon **26** is changed to the call on hold state icon **28**. Also, when the idle state

icon **21** is clicked upon by the right mouse button, the idle state icon **21** is changed to the call originated state icon **22**. Meanwhile, a speed dialing function is called and run. This is executed by providing a Speed Call form as described later with reference to Figure 15.

In order to change the icons to constantly display the telephone line state, the following sample code may be utilized:

```
Public Sub SetState (Station As String, State As String, PicID As Ineger)
Dim I as Integer
I = 0
If Station = gStation(1) Then
        I = 1
End If
If State <> "" Then
        gState(I) = State
End If
If PicID <> TEL_NOCHANGE Then
        CmdTel(I). Picture = Picture(PicID)
End IF
End Sub
```

The above code checks the state of the telephone line and updates the icon displaying the state of the telephone line accordingly. This means that when the state of the telephone line changes, a new PicID is provided and the icon corresponding to the new state of the telephone line is shown.

Turning to Figure 5, the present example involves a telephony agent application. The application is installed on a workstation **118**, preferably Windows® 95-based, which is connected to a TCP/IP network **120**. The application communicates with a PBX **122** via a Telephony Gateway **124**.

Turning to Figures 6 - 18, screen prints of TAPI compliant computer application windows are provided to illustrate preferred embodiments of the present invention. The screen prints are the interactive displays which a telephone operator sees when the telephone operator is using the telephony agent application.

In operation, the telephone operator sees the screen print of Figure 6 as an

initial start up screen. Figure 6 shows a telephony agent application window **31** which is configured to handle one telephone line **33**. It will be understood that the number of lines is only restricted to the telephone line capabilities of the computer. A Locate button **32** provides access to a corporate directory database while a Contacts button **34** provides access to a contact manager. The Locate button **32** and the Contacts button **34** will be well known to those skilled in the art as means to invoke a database search of all stored phone numbers and a listing of all personal phone numbers used respectively. The Locate and Contacts buttons **32** and **34** are known in the art of graphical user interfaces and are simply used in Figures 6 – 18 to help illustrate the telephony agent application and are not a part of the disclosed invention.

It will be understood by those skilled in the art that for multiple line telephone sets, the graphical user interface has separate telephone icons representing the status of each individual line with full call control functionality.

Figure 6a provides a screen print of a telephony agent application window **41** configured for two telephone lines **40** and **42**. As with the single telephone line configuration, the application window **41** provides a Locate button **32** and a Contacts button **34**. While waiting for a call to be received, the status of the two telephone lines **40** and **42** are shown as idle via the idle state icons **21**.

Figure 7 shows the two-telephone line telephony application window when a call is received on one of the two telephone lines. In the present example, the call is received on telephone line **40**. Figure 7a is a flow chart showing the actions of the application when the call is received.

When the telephone call is received on telephone line **40** (step **130**) by the telephony agent application, the application proceeds to change the idle state icon **21** (Figure 6a) for the telephone line **40** to the call ringing state icon **24** (step **132**) and searches configured databases for call information (step **134**). This is implemented via the SetState sample code provided above. In operation, after the SetState code is executed, the new state of the telephone line is acknowledged and the call ringing state icon **24** replaces the idle state icon **21**. This is achieved using If-Then statements in the software application. If the caller information is found in the database, a status bar window **43** corresponding to telephone line **40** displays the caller information (step **136**) otherwise, a message stating that a call has been

received is displayed (step **138**). It will be understood that the idle state icon **21** for the second telephone line **42** does not change since the call was received on telephone line **40**.

To answer the telephone call, the telephone operator left-clicks on the call ringing state icon **24** and the application, at step **140**, changes the call ringing state icon **24** to the call established state icon **26** (shown in Figure 8). The application proceeds to send a message to the PBX allowing communication between the caller and the operator to commence (step **142**). The state of the icon is driven buy messages received from the PBX. Once the call established state icon **26** appears, the application window **41** is extended to include a Transfer icon **45**. The status bar window **43** displays the "Call Established" state and the party name (similar to Call Display) found in the database.

To put the telephone call on hold, the telephone operator left clicks on the call established icon **26** to change the call established icon **26** to the call on hold icon **28** (as shown in Figure 9). The application sends a message to the telephone corresponding to telephone line **40** indicating that the call has been placed on hold. The status bar window **43** is updated to reflect the latest status of telephone line **40**.

Figures 10 – 12 provide an example of how to handle simultaneous calls using the telephony agent application of the present invention while Figure 10a provides a flow chart of the status of the telephone lines during the handling of the simultaneous calls. In the present example, telephone line **40** is currently in a call established state (step **144**) and telephone line **42** is in an idle state (step **146**).

Actions similar to the actions discussed above with respect to telephone line **40** are required when a call is received on the second telephone line **42**. As can be seen in Fig. 10, a call has previously been established on telephone line **40**. This is shown by the call established state icon **26** representing telephone line **40**. A telephone call is received on telephone line **42** (as seen by the call ringing state icon **24** with respect to telephone line **42**). A status bar window **47** provides the status of telephone line **42**.

As with Figure 7a, when the telephone call is received on telephone line **42** (step **130**) by the telephony agent application, the application proceeds to change the idle state icon **21** for the telephone line **42** to the call ringing state icon **24** (step **132**) and searches configured databases for call information (step **134**). If the caller information is found in the database, a status bar window **47** corresponding to telephone line **42** displays the caller

information (step **136**) otherwise, a message stating that a call has been received is displayed (step **138**). It will be understood that telephone line **40** continues to display the call established icon **26** (step **144**).

To answer the telephone call on telephone line **42**, the telephone operator must left click on the call ringing state icon **24**. This causes the call ringing state icon **24** to change to the call established state icon **26** (step **140**) as shown in Figure 11. When the call ringing state icon **24** is left clicked by the operator, the application proceeds to send a message to the telephone corresponding to telephone line **40** stating that the call has been placed on hold. Subsequently, the call established icon **26** (Figure 10) for telephone **40** automatically changes to the call on hold icon **28** (step **148**), as shown in Figure 11 and the telephone call for telephone line **40** is put on hold (step **150**).

In order to retrieve the held call on telephone line **40** (Figure 12), the telephone operator left clicks on the call on hold icon **28** (step **151**) for telephone line **40** and re-establishes the call (step **152**). The application sends a message to the telephone corresponding to telephone line **40** and re-establishes the call and sends a message to the telephone corresponding to telephone line **42** to put the call on hold (step **154**). Therefore, when the telephone call on telephone line **40** is re-established (step **156**), the telephone call on telephone line **42** is put on hold (step **158**). The call on hold icon **28** for telephone line **40** is changed to the call established icon **26** (step **160**) while the call established icon **26** for telephone line **42** is changed to the call on hold icon **28** (step **162**). This is shown as the call on hold icon **28** for telephone line **42**. Status bar windows **43** and **47** provide the status of the telephone lines **40** and **42**.

It will be understood by those skilled in the art that similar actions (i.e. clicking on the icons with right mouse button) performs the actions as set out in Figure 4.

Figures 13 – 14 provide an example of how to transfer calls and enable a conference call using the telephony agent application and the present invention. Figure 13a provides a flowchart showing the actions of the telephony agent application with respect to transferring calls.

By clicking on the Transfer icon **45** (step **164**), a Transfer/Conference form **50**

appears (step **166**). The Transfer/Conference form **50** includes a telephone number window **52**, a Locate button **54**, a Contact DB button **56**, a Transfer button **58**, a Voice Mail button **60** and a Cancel button **62**.

If the telephone operator knows the transfer destination, the operator types the telephone number into the telephone number window **52** (step **168**) and clicks on the Transfer button **58** (step **170**). Alternatively, if the voice mail button **60** is clicked (step **172**), the telephone call is transferred directly to a voice mail box (step **174**).

The Locate button **54** and the Contact DB button **56** are used when the transfer destination is to be found in a database. The telephone operator may also decide to cancel the transfer by clicking on the Cancel button **62** (step **176**). The operator then exits (step **178**) the Transfer/Conference form.

Once the call transfer is initiated and the call delivered, the transfer form **50** expands to include two additional buttons: a Complete Transfer button **64** and a Conference button **66**. The Complete Transfer button **64** is initially enabled while the Conference button **66** is initially disabled. The Complete Transfer **64** (step **180**) releases the telephone operator from the telephone call (step **182**) while the Conference button **66** (step **184**)allows the telephone operator to join in the conversation (step **186**).

Figures 15 – 18 provide examples of how to initiate telephone calls using the telephony agent application. Figure 15a provides a flow chart of the actions of the telephony agent application during the initiation of a telephone call.

In the present example, a telephone call is initiated (step **190**) in one of four ways:

1. By clicking the left mouse button on the call originated state icon **22** – regular dial out (Figure 15);
2. By clicking the right mouse button on the call originated state icon **22** – speed dialing (Figure 16);
3. By clicking the left mouse button the Locate button **32** or Locate button **54** to dial from a Locate window(Figure 17); and
4. By clicking the left mouse button on the Contacts button **34** or Contact DB button **56** to dial from a Contact database window (Figure 18).

In order to initiate a regular dial out, a left mouse click on the call originated

state icon **22** (step **192**) causes a Dial window **70** to appear (step **194**). By clicking a redial button **72** (step **196**), the telephone operator may re-dial the last number (step **198**), shown in a last number dialed window **71**. The telephone operator may also type a telephone number into a new number to dial window **74** (step **200**) and clicking a dial button **76** (step **202**). The telephone number is then dialed (step **204**). The user may also decide to initiate a database lookup by clicking on the Locate button **54** or the Contact DB button **56** (step **206**). It will be understood that Locate button **32** and Locate button **54** perform the same function. This is also true for the Contacts button **34** and the Contact DB button **56**. The user may also decide to cancel the telephone call by clicking on the Cancel button **80** (step **208**). The telephone operator is then exited from the Dial window (step **210**).

In order to initiate a speed dialing call, a right mouse click on the call originated state icon **22** (step **212**) causes a speed call numbers window **82** to appear (step **214**). The speed call numbers window comprises a list **84** of telephone numbers **83**. By selecting one of the numbers **83** (step **216**) displayed in the list **84**, a telephone call is initiated (step **218**).

In order to initiate a telephone call using the locate button **32** or **54**, when the telephone operator left clicks on the locate button **32** or **54** (step **220**), a locate directory window **85** appears (step **222**). The telephone operator then selects a search field by clicking on the arrow **87** beside the select field list **86** (step **224**). In the present example, the telephone operator has decided to search by name. The telephone operator then proceeds to enter a search term into a search text window **88** (step **226**). In the present example, the telephone operator is searching for people with the letters "kav" at the beginning of their name. The telephone operator then selects the target person from a display window **90** (step **228**) by left clicking the mouse on the person's name and then, by left clicking on idle state icon **21** (step **230**), initiates a call (step **232**).

Finally, in order to initiate a telephone call using the Contacts button **34** or the Contact DB button **56**, when the telephone operator left clicks on the Contacts button **34** or Contacts DB button **56** (step **234**), a Contacts Database window **90** appears (step **236**). In order to initiate the call, the telephone operator finds the target person in the database, left clicks on the phone text box to select the number to dial (step **238**) and then left clicks the idle state icon **21** (step **240**). The call is then initiated (step **242**)

The user may also add or delete contacts in the database by clicking on the Add and the Delete buttons **92** and **94** respectively.

It will be appreciated that, although a particular embodiment of the invention has been described and illustrated in detail, various changes and modifications may be made. For example, the style and size of the picture **10** or **12** used may be selected by a developer of the graphical user interface. Also the choice of colours for the different backgrounds are not restricted to the colours described above. Also, the changes associated with the activation events do not have to be the same as detailed above. All such changes and modifications are believed to be within the sphere and scope of the invention as defined by the claims appended hereto.

CLAIMS

1. A method of simplifying telephony actions in a telephony application graphical user interface comprising the steps of:

a) providing a first icon showing an initial status of a telephone line;

b) sensing an activation event;

c) changing said first icon to a second icon to show an updated status of said telephone line.

2. The method of Claim 1 wherein said mouse activation event is a mouse button click or a keyboard stroke.

3. The method of Claim 1 wherein said first predetermined icon and said second predetermined icon are selected from a set of icons.

4. A telephony application graphical user interface which simplifies telephony actions comprising:

a first icon showing an initial status of a telephone line;

a second icon showing an updated status of a telephone line;

means to change said first icon to said second icon when an activation event is sensed.

5. The telephony application graphical user interface of Claim 4 wherein said activation events are mouse button clicks or keyboard strokes.

6. The telephony application graphical user interface of Claim 5 wherein said mouse button clicks are either a right mouse button click or a left mouse button click.

7. The telephony application graphical user interface of Claim 6 wherein said first icon is one of an idle icon, a call ringing icon, a call established icon, a call on hold icon, a call originated icon and a call a call delivered.

8. The telephony application graphical user interface of Claim [redacted] wherein said idle icon changes to a call originated icon when said left mouse button click is sensed.

9. The telephony application graphical user interface of Claim 7 wherein said call ringing icon changes to a call established icon when said left mouse button click is sensed.

10. The telephony application graphical user interface of Claim 7 wherein said call established icon changes to an idle icon when said left mouse button click is sensed.

11. The telephony application graphical user interface of Claim 7 wherein said call on hold icon changes to a call established icon when said left mouse button click is sensed.

12. The telephony application graphical user interface of Claim 7 wherein said call originated icon changes to an idle icon when said when said left mouse button click is sensed.

13. The telephony application graphical user interface of Claim 7 wherein said call delivered icon changes to an idle icon when said when said left mouse button click is sensed.

14. The telephony application graphical user interface of Claim 7 wherein said idle icon changes to a call originated icon when said right mouse button click is sensed.

15. The telephony application graphical user interface of Claim 7 wherein said call established icon changes to a call on hold icon when said right mouse button click is sensed.

16. The telephony application graphical user interface of Claim 7 wherein said call on hold icon changes to an idle icon when said right mouse button click is sensed.

17. A method according to claim 1 and/or the interface according to any of claims 3 to 16 substantially as herein described with reference to and as shown in the accompanying drawings.

16

Application No: GB 9926182.8
Claims searched: 1-17

Examiner: Richard Howe
Date of search: 12 April 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): H4K (KFH) ; H4T (TBLA, TBLX)

Int Cl (Ed.7): H04M (1/00)

Other: Online : wpi ; epodoc ; japio

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2 295 747 A	(Mitel) - see whole document especially page 5 lines 9-14	1-16
X	WO 97/08879 A2	(Philips) - see whole document especially abstract	1-16
X	US 5 644 628	(Alcatel) - see whole document especially icon 4 in figures 2C and 2D	1-16

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.